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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,581	06/15/2005	Jean-Pierre Franciscus Alexander Maria Ermes	NL 021264	9048

24737 7590 05/16/2007
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER

FERNANDEZ, KATHERINE L

ART UNIT	PAPER NUMBER
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3768

MAIL DATE	DELIVERY MODE
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05/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/538,581	ERMES, JEAN-PIERRE FRANCISCUS ALEXANDER
	Examiner Katherine L. Fernandez	Art Unit 3768

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 16 February 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 6/15/2005 is/are: a) accepted or b) objected to by the Examiner. Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>2/16/2007 and 6/15/2005</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application
	6) <input type="checkbox"/> Other: _____

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statements filed on June 15, 2005 and February 16, 2007 are acknowledged. The information disclosure statements meet the requirements of 37 C.F.R. 1.97 and 1.98 and therefore the references therein have been considered.

Claim Objections

3. Claim 5 is objected to because of the following informalities:

On line 10 of claim 5, there is a typo in the statement "data processing means for through assuming...". It is suggested that the word "through" should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zuffi et al. ("A Model-Based Method for the Reconstruction of Total Knee Replacement Kinematics", October 1999) in view of Lavallee et al. ("Recovering the Position and Orientation of Free-Form Objects from Image Contours Using 3D Distance Maps", April

1995), and further in view of Wen et al. ("Structure Inference and Pose Estimation Based on Symmetry of Objects").

Zuffi et al. disclose a model-based method for the estimation of the three-dimensional position and orientation (pose) of both the femoral and tibial knee prosthesis components during activity (abstract). Zuffi et al. disclose that the femoral and tibial components are symmetric with respect to the sagittal plane in most prosthesis designs (pg. 983, Section II.A). They further disclose that the pose is estimated from a single view by aligning a 3D object model to obtain a corresponding projection as observed in an X-ray image (pg. 983, Section II. Methods). As can be seen from Figure 3, their method involves a measurement configuration that uses an X-ray source and a pre-specified implant object position, and generating an implant shadow on the reference image (pg. 983, Figure 3). A CAD model is used for the pose estimation (pg. 984-985, Section II.E). As can be seen from Figure 4, an iterative pose estimation process is performed that involves finding and computing alternative poses until a pose is found that matches the contour of the x-ray image (i.e. matching means) (pg. 985, Figure 4). For data processing, Zuffi et al. disclose using a C++ compiler and running it on a computer.

However, Zuffi et al. do not disclose generating a second measurement configuration and a second implant shadow, nor do they assume for each first and second measurement configuration an instance of said n-dimensional structure of symmetry. They also do not disclose that a pair of alternative poses of said implant object is calculated as being symmetrical with respect to said n-dimensional structure,

nor that they find among said pairs of alternative poses two matching poses that thereby produce an angle information with respect to said n-dimensional structure of symmetry of said implant object. Further, Zuffi et al. do not disclose the limitations of claims 2-4 (i.e. the n-dimensional structure of symmetry either being a plane, a straight line, an axis of rotary symmetry).

Lavallee et al. disclose a method for determining the rigid body transformation that describes the accurate matching of 3D anatomical surfaces with data such as 2D X-ray projections (abstract). They disclose that their method involves taking X-ray images of the patient from two different viewpoints (pg. 378, Introduction). They use a registration technique to match a segmented 3D smooth surface of an anatomical structure with two or more contours of the same anatomical structure extracted from its X-ray projections (pg. 378, Introduction; also see Figure 1). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the method of Zuffi et al. to include a second measurement configuration and a second implant shadow. The motivation for doing so would have been that two or more projections are necessary to achieve a sufficiently accurate estimate of the pose, as taught by Lavallee et al. (pg. 378, Introduction).

However, Zuffi et al. in view of Lavallee et al. do not disclose that they assume for each first and second measurement configuration an instance of said n-dimensional structure of symmetry. They also do not disclose that a pair of alternative poses of said implant object is calculated as being symmetrical with respect to said n-dimensional structure, nor that they find among said pairs of alternative poses two matching poses

that thereby produce an angle information with respect to said n-dimensional structure of symmetry of said implant object. Further, Zuffi et al. in view of Lavallee et al. do not disclose the limitations of claims 2-4 (i.e. the n-dimensional structure of symmetry either being a plane, a straight line, an axis of rotary symmetry).

Wen et al. disclose an algorithm for inferring structure and estimating pose or orientation of object based on its symmetry (abstract). Their method involves taking an image of the object, segmenting the image into several regions, and determining the symmetry and finding their symmetry axes (i.e. assuming an instance of said n-dimensional structure of symmetry) (pg. 767, Section 2). They further disclose that if more than one symmetry planes of an object are known, then the geometric structure of the occluded part can be recovered (pg. 767, Section 2). The orientation angles of the object can be obtained (pg. 769, Section 4.2; also see Figure 4.3). With regards to claim 2, Wen et al. disclose that the n-dimensional structure of symmetry is a plane (pg. 768, Section 4). With regards to claim 3, Wen et al. disclose that said n-dimensional structure of symmetry is a straight line (pg. 767-768, Section 3). With regards to claim 4, as can be seen from Figure 4.4, axis bn can be viewed as an axis of rotary symmetry of the implant object (pg. 770, Figure 4.4). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the method of Zuffi et al. in view of Lavallee et al. to assume for each of the measurement configurations an instance of n-dimensional structure of symmetry, have the alternative poses that are calculated to be symmetrical with respect to said n-dimensional structure, and finding among pairs of alternative poses two matching poses that produce an angle information with respect to

said n-dimensional structure of symmetry of said implant object, as well as to include the limitations of claims 2-4. The motivation for doing so would have been that symmetry planes of object can be used to recover the geometrical structure and pose of an object, as taught by Wen et al. (pg. 767-768, Sections 2-3).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine L. Fernandez whose telephone number is (571)272-1957. The examiner can normally be reached on 8:30-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eleni M. Mantis-Mercader can be reached on (571)272-4740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

E. Fernandez
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SPE 3768